1148-28-70 **Max Goering*** (mgoering@uw.edu). *Non-local curvatures and the geometry of measures.*

Uniformly rectifiable sets have played a fundamental role in the development of harmonic analysis in non smooth settings.

In one-dimension the 1996 paper of Mattila, Melnikov, and Verdera first made use of the classical Menger curvature to provide a new proof that Uniformly Rectifiable (UR) curves are characterized by the $L^2$-boundedness of the the Cauchy integral operator in the plane. Their new technique was based on an identity for the classical Menger curvature which directly relates it to the Cauchy integral operator. This opened the floodgates in relating the analytic and geometric properties of one-dimensional sets and measures.

Higher-dimensional analogs of the Menger curvature were much sought after until 2000 when Farag showed that there was no algebraic generalization of the identity used by Mattila, Melnikov, and Verdera that could directly relate to the Riesz kernels. Nonetheless, in 2013 Lerman and Whitehouse proved that geometrically motivated analogs of the Menger curvature can be used to characterize uniformly rectifiable sets of any dimension and codimension.

In this talk, we provide a new characterization of the much wilder class of rectifiable measures in terms of discrete curvatures. (Received January 23, 2019)